

Educating and Motivating Leaders for the 21st Century

Stan C. Preczewski
U.S. Military Academy

Julia A. Hughes-Caplow and Joe F. Donaldson
University of Missouri--Columbia

Research and Advanced Concepts Office
Michael Drillings, Director

March 1996



19960603 005

United States Army
Research Institute for the Behavioral and Social Sciences

Approved for public release; distribution is unlimited.

U.S. ARMY RESEARCH INSTITUTE FOR THE BEHAVIORAL AND SOCIAL SCIENCES

**A Field Operating Agency Under the Jurisdiction
of the Deputy Chief of Staff for Personnel**

EDGAR M. JOHNSON
Director

Research accomplished under contract
for the Department of the Army

U.S. Military Academy

Technical review by

George W. Lawton

NOTICES

DISTRIBUTION: This report has been cleared for release to the Defense Technical Information Center (DTIC) to comply with regulatory requirements. It has been given no primary distribution other than to DTIC and will be available only through DTIC or the National Technical Information Service (NTIS).

FINAL DISPOSITION: This report may be destroyed when it is no longer needed. Please do not return it to the U.S. Army Research Institute for the Behavioral and Social Sciences.

NOTE: The views, opinions, and findings in this report are those of the author(s) and should not be construed as an official Department of the Army position, policy, or decision, unless so designated by other authorized documents.

REPORT DOCUMENTATION PAGE

1. REPORT DATE 1996, March		2. REPORT TYPE Final		3. DATES COVERED (from... to) August 1995-October 1995	
4. TITLE AND SUBTITLE Educating and Motivating Leaders for the 21st Century				5a. CONTRACT OR GRANT NUMBER DASW01-95-M-5735	
				5b. PROGRAM ELEMENT NUMBER 0601102A	
6. AUTHOR(S) Stan C. Preczewski (USMA), and Julia A. Hughes Caplow and Joe F. Donaldson (University of Missouri-Columbia)				5c. PROJECT NUMBER B74F	
				5d. TASK NUMBER 4901	
				5e. WORK UNIT NUMBER C10	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) United States Military Academy West Point, NY 10996-1784				8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES) U.S. Army Research Institute for the Behavioral and Social Sciences ATTN: PERI-BR 5001 Eisenhower Avenue Alexandria, VA 22333-5600				10. MONITOR ACRONYM ARI	
				11. MONITOR REPORT NUMBER Research Note 96-31	
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution is unlimited.					
13. SUPPLEMENTARY NOTES COR: George Lawton					
14. ABSTRACT (Maximum 200 words): The purpose of this research was to compare a current instructional approach used in one course, C51: Strategic, Operational, and Joint Environments, of the Command and General Staff Officer Course (CGSOC) to an alternative instructional approach derived from the Problem-Based learning (PBL) approach. Specifically, this research sought to determine if: (1) a cued retrieval instructional strategy in a problem-oriented instructional situation would foster encoding specificity, hence, retention; and, (2) a focus on identification of learning issues by participants would foster an orientation to self-directed, continuing learning.					
15. SUBJECT TERMS Motivating leaders Decision making Leadership Problem solving Problem-Based Learning Alternative instruction					
SECURITY CLASSIFICATION OF			19. LIMITATION OF ABSTRACT	20. NUMBER OF PAGES	21. RESPONSIBLE PERSON (Name and Telephone Number)
16. REPORT Unclassified	17. ABSTRACT Unclassified	18. THIS PAGE Unclassified	Unlimited	27	Dr. George Lawton (703) 617-5590

EDUCATING AND MOTIVATING LEADERS FOR THE 21ST CENTURY

CONTENTS

	Page
INTRODUCTION	1
BACKGROUND	2
STATEMENT OF THE PROBLEM	3
METHOD	5
Procedure	5
Data Collection	7
Concept Map Scoring	7
Scoring of Oddi Continuing Learning Inventory	9
Analysis	9
RESULTS	10
DISCUSSION AND IMPLICATIONS	13
REFERENCES	15
APPENDIX A. STRATEGIC, OPERATIONAL AND JOINT ENVIRONMENTS-- LESSON 7. STRATEGIC ESTIMATE	A-1
B. IMPLEMENTING TWO ELEMENTS (ACTIVATION OF PRIOR KNOWLEDGE & IDENTIFICATION OF LEARNING ISSUES) OF PROBLEM-BASED LEARNING IN C510 LESSON 7: STRATEGIC ESTIMATE--KOREAN PENINSULA/NORTHEAST ASIA	B-1
C. DEMOGRAPHIC INFORMATION	C-1

LIST OF TABLES

Table 1. Analysis of Dependent Variables by Study and Comparison Groups	12
---	----

Educating and Motivating Leaders for the 21st Century

Introduction

The purpose of this research was to compare a current instructional approach used in one course, C510: Strategic, Operational, and Joint Environments, of the Command and General Staff Officer Course (CGSOC) to an alternative instructional approach derived from the Problem-Based Learning (PBL) approach. Specifically, this research sought to determine if: (1) a cued retrieval instructional strategy in a problem oriented instructional situation would foster encoding specificity, hence, retention; and, (2) a focus on identification of learning issues by participants would foster an orientation to self-directed, continuing learning.

Problem-based learning is an instructional innovation in medical education first adopted by McMaster University in the mid 1960s. Since that time, approximately 60 medical schools worldwide have implemented, at least in part, a problem-based learning approach in their curricula (Norman & Schmidt, 1992). Albanese and Mitchell (1993) described PBL as "an instructional method characterized by the use of patient problems as a context for students to learn problem-solving skills and acquire knowledge about the basic and clinical sciences" (p 53).

Barrows (1986) articulated four major educational goals of PBL. The first is the structuring of knowledge for use in practice contexts. Imbedded in this goal is the notion that retention, recall, and application of new knowledge is enhanced as knowledge is acquired in a problem context. A second goal of PBL is the development of reasoning processes including hypothesis generation, inquiry, data analysis, problem synthesis, and decision-making. The third goal is the development of self-directed learning skills deemed critical for practitioners as they confront an expanding knowledge base and unusual or unique problems in practice. The final major goal of PBL is to enhance intrinsic motivation for learning. The rationale for this goal is that the opportunity to solve problems in a simulated practice situation is inherently motivating.

One of the challenges in research on the medical school PBL model is its multiple and overlapping theoretical foundations. These foundations include information processing theories, constructivist perspectives of learning, and cooperative learning. Furthermore, because PBL is

generally implemented in a cooperative learning environment, it purports to provide learners with the opportunity to elaborate, link, interpret, and explain new knowledge in a group context.

Background

Research to date on PBL has focused on two major areas: (1) program evaluation issues; and, (2) comparisons of students' achievement on medical boards and clinical performance assessments in conventional vs. problem-based curricula. Recently, research has addressed the underlying learning processes of PBL that produce the effects that have been reported on achievement, clinical behavior, use of informational resources, and study patterns (Caplow, Donaldson, Kardash, & Smith, 1994). However, no research to date has investigated any of the specific underlying theoretical constructs of PBL.

One area of potential research about PBL is the problem solving process. Bransford, Sherwood & Sturdevant (1987) have articulated five steps to the problem solving process: (1) problem identification; (2) problem definition; (3) exploration of alternative solutions; (4) acting on a solution; and, (5) assessing the effects of the solution. Phye (1992) made a distinction between academic problem solving, which is based on prior instruction, and creative problem solving, which is not based on prior instruction. There is an extensive body of research on the various cognitive processes and related instructional strategies involved in successful academic problem solving, the review of which is beyond the scope of this report. Briefly, however, according to Bransford, Sherwood & Sturdevant (1987), activation of prior knowledge is important in the identification and definition of a problem. The activation of acquired knowledge for the problem situation depends on how or if it was stored in long term memory. In other words, the knowledge must be both available and accessible for application to the problem situation.

A second area of potential research is on the transfer of acquired knowledge or competencies to an actual practice situation. Phye (1992) made a distinction between transfer appropriate processing and transfer appropriate procedures. In transfer appropriate processing, the focus of instructional strategies is on facilitating encoding specificity for the transfer process

by anchoring instruction in simulated “real life” contexts. An example of this is the instructional strategy of PBL used in medical schools of using patient cases as the stimulus to acquire new knowledge. In this example, the patient case serves as a context for encoding specificity: providing a context for the acquisition of knowledge similar to the actual practice situations in which they are applied. The activation of prior knowledge of the learner that is relevant to the case is based on spontaneous retrieval. According to Tulving (1983), spontaneous retrieval occurs only if properties of the new situation are similar to properties of the situation in which the knowledge was acquired (encoding specificity assumption). Therefore, at issue is the encoding specificity of knowledge at initial acquisition and its relationship to availability and accessibility (retrieval) and application to a new, but similar situation (transfer). In transfer appropriate procedures, the focus of instructional strategies is on facilitating access of prior knowledge, therefore, memory retrieval rather than encoding specificity is emphasized. An example of an instructional strategy that would facilitate access of prior knowledge to apply to a problem situation would be cued retrieval strategies, such as questioning, prior to the transfer task.

Statement of the Problem

The medical school PBL model is a comprehensive curriculum that uses several broad instructional approaches (e.g., problem-oriented learning, cooperative learning environments). A cornerstone instructional strategy of the medical school PBL approach is the use of a simulated situation (a patient case) to facilitate acquisition and retention of knowledge for transfer to actual practice situations. Analysis of one of the broad goals of PBL--structuring knowledge for use in a practice setting-- indicates that it is based on several underlying theoretical constructs derived from cognitive theories of learning. These constructs are anchored instruction (or situated cognition), spontaneous retrieval, encoding specificity, and transfer appropriate strategies. However, to date, research on the medical school PBL approach has not addressed these individual constructs and their relation to knowledge acquisition and retention.

Bridges & Hallinger (1992; 1995) suggest an alternative to the medical school PBL model. This alternative model shares the goals and is informed by many of the same cognitive

learning theory constructs (i.e. anchored instruction, encoding specificity, and transfer appropriate strategies) as the medical school model. But it differs from the medical school model in one important way: the learning objectives and questioning are under the control of the instructor rather than the learners. Objectives for the problem are specified in advance by the instructor, and guiding questions are provided learners to direct them to key concepts, assist them in thinking through the problem, and stimulating them to approach the problem from multiple perspectives. Therefore, in contrast to the medical school model, the Bridges and Hallinger model employs cued, rather than spontaneous, retrieval of prior knowledge, as well as strategies that direct learners to content relevant to problem resolution. Yet, research on this alternative PBL approach has also failed to address underlying constructs of cognitive learning theory and their relation to knowledge acquisition and retention.

Still other strategies exist for instructors' use in facilitating the acquisition and retention of knowledge for transfer to actual practice situations. An example is the approach used in the C510 (Strategic, Operational, and Joint Environments) course offered at Ft. Leavenworth as part of the Command and General Staff Officer Course. The typical format for this course is one in which students acquire knowledge in more conventional ways; such as reading, lecture, and discussion, and are then presented with a problem (transfer task) that requires the application of acquired knowledge. In this case, anchored instruction at the time of knowledge acquisition is not used, hence limiting deliberate attempts via an instructional strategy to facilitate encoding specificity. In the absence of specific instructional strategies to facilitate retrieval of prior knowledge, spontaneous retrieval is used by the learner. However, the use of an instructional strategy to stimulate recall when the problem situation is presented after knowledge acquisition (through conventional means, such as reading, lecture, discussion) provides the opportunity for encoding specificity at the time of transfer. A major speculation of this study was that the use of a questioning strategy designed to stimulate cued retrieval strategies may strengthen the students' access of relevant prior knowledge for application to the problem. Therefore, a modified PBL approach, drawn from strategies employed in the medical school and the Bridges and Hallinger

models of PBL, was introduced into the instructional design of the C510 course for the purposes of testing this speculation about cued retrieval and access of relevant prior knowledge.

An orientation towards self-directed learning by students in a PBL curriculum has also been noted in the literature. Specifically, Vernon and Blake (1993), in a meta-analysis of research on PBL, reported that students in a PBL curriculum engaged in more self-directed learning (e.g., greater use of the library and use of self-selected rather than faculty-selected reading materials). In addition, they found that students in a PBL curriculum placed greater emphasis on understanding material rather than memorization or rote learning than did students in a traditional curriculum. Blumberg and Michael (1992) also reported that PBL fosters self-directed learning. Their conclusion was based on student self-reports, accreditation and program evaluation documents, and library circulation statistics. Based on these findings, a second speculation of this study was that the implementation of a specific instructional strategy to lead students to the identification of learning issues (needed areas of learning to solve the problem) would foster an orientation towards self-directed learning. Therefore, this strategy was introduced into the design of the C510 course to test this speculation about self-directed, continuing learning.

Method

Procedure

The three member research team (Caplow, Donaldson, and Preczewski) first met with the major actors relevant to C510. These included the Director of the Command and General Staff School, the Director of the Department of Joint and Combined Operations (DJCO), and the course directors for C510. This meeting served to outline the proposed research methods to those responsible for the conduct of the course. Approval to access four different staff groups of C510 was granted and faculty volunteers were secured.

The research team next spent several days observing the faculty development seminars designed to prepare DJCO instructors to teach C510. The course is comprised of eight lessons with the first six providing the knowledge necessary to successfully complete a capstone application task in Lesson 7. This task requires students to prepare a strategic estimate and

analysis concerning a notional crisis emerging between North and South Korea. Lesson 8 is a transition lesson for a subsequent course.

In addition to attending faculty development seminars, the team conducted a detailed analysis of all the course materials. The key knowledge and concepts related to the task requirements of Lesson 7 were determined from the analysis of course materials, interviews with the course directors, and observations of the faculty development seminar. A key concept list was developed and presented to the course director for a final check on completeness and accuracy. These key concepts became one of the dependent variables measured upon completion of the lesson.

Four C510 staff groups of 15-17 students in each staff group participated in the study. Two of these groups were the comparison groups and two were the study groups. The same instructor taught both comparison groups and the same instructor taught both study groups; and the course content was the same for all four groups. The course is offered on a rotating basis. During the first rotation in August, one comparison group and one study group were observed during Lessons 6, 7, and 8 and data were collected. When the course was offered on the second rotation (September), data were collected from one comparison and one study group. These two groups were not observed. The first rotation of the comparison and study groups were observed to identify instructional approaches and activities. A member of the researcher team met with the instructors prior to the second rotation of the course to gain assurance that instructional approaches and activities would remain similar to those used during the first rotation. Upon completion of the second rotation of the course, the instructors were interviewed to check whether or not the class did indeed proceed in a fashion similar to the first observed rotation. They reported no significant differences in the classroom proceedings nor the quality of the final group product between the staff groups in the first rotation and those in the second rotation.

The instructor of the comparison groups used the standard instructional approach, as presented in the faculty development seminar. In these groups, the instructional strategies used in Lessons 1 through 6 included lecture, reading, and group discussion. In preparation for Lesson 7,

students were provided with an overview of the strategic estimate process and then given the task scenario (see Appendix A) to complete as a total group.

The instructional strategies used by the instructor of the study groups for Lessons 1 through 6 also included lecture, reading, and group discussion. However, prior to being presented with the task, these groups were each divided into two groups of eight and given questions designed to stimulate cued recall of relevant knowledge and concepts learned in Lessons 1-6 and to be applied to the task (see Appendix B). Questions were developed to stimulate cued recall of information relevant to two parts of the scenario: the *Background* and the *Situation*. After the two groups of eight responded to the questions relevant to the *Background* of the scenario, they re-grouped as a total class and provided a briefing to the instructor. Then, they split into the two groups of 7-8 students to address the questions relevant to the *Situation* and, again, re-grouped for a briefing. This allowed the instructor to check and remediate learning prior to the students completing the strategic estimate task which culminated in a final briefing.

Data Collection

Upon completion of the briefing of the scenario task (Strategic Estimate) of Lesson 7, students were immediately asked to remain in the classroom to participate, on a voluntary basis, in data collection relevant to their learning. All of the students remained, but as reported in the results, not all participated in all components of the data collection.

The students (and the two instructors) were each issued a packet containing three items: (1) the Oddi Continuing Learning Inventory (OCLI); (2) a demographic questionnaire; and, (3) three blank sheets of paper and instructions with an example for completing a concept map (see Appendix C). They were directed to spend three minutes completing the demographic questionnaire, eight to ten minutes completing the self-directed learning inventory, and twenty minutes completing a concept map. Students were provided instructions and an example for developing concept maps. They were told to complete a map with a focal concept of *Strategic Estimate* and to then write all the concepts and sub-concepts brought to mind when the focal concept was considered. Further, they were instructed to include in the map some representation

of how the concepts were connected (if appropriate). The packets were coded to keep the three items together and the groups separate.

The independent variable of this study was the use of a modified PBL approach in the study groups. Dependent variables included three measures obtained from the concept maps: (1) number of concepts; (2) linkages among concepts; and, (3) accuracy of concepts; and four measures of orientation toward self-directed, continuing learning. These four measures were: (1) the overall score on the OCLI; (2) general factor; (3) ability to be self-regulating; and, (4) avidity of reading.

Concept Map Scoring

Concept maps were analyzed by scoring (1) *concepts* (the number of core, major, and subsidiary concepts contained in concept maps); (2) *linkages* (the quantity and complexity of relationships among concepts); and, (3) concept *accuracy*. Different scores were given for core, major, and subsidiary concepts in order to measure hierarchical relationships among concepts, which incorporates the idea of subsumption of concepts under more general ones. Linkage scoring was based on the number of connections made among concepts, as well as on the complexity of the connections (e.g., a simple line connecting two concepts versus a line with arrows pointing in two directions). Linkage scores were used as measures of progressive differentiation, in which new concepts gain greater meaning as links are formed, and of integrative reconciliation in which new links among related sets of concepts are developed by learners (Rafferty & Fleschner, 1993; Novak & Gowin, 1984). Accuracy of concepts was used to measure the extent to which encoding specificity was achieved, and, given the focus of the study, was the major dependent variable. Concepts were considered accurate if they were (1) concepts identified by course authors and instructors as central to strategic estimates; and/or (2) the focus of cued retrieval strategies employed in the instructional approach used with the study groups.

Concept maps were scored independently by the three investigators over three iterations. In the first iteration, maps were scored independently and investigators' scoring (not the maps themselves) were compared for level of agreement. Major discrepancies among scores required all investigators, in the second iteration, to re-score the particular concept maps that were in

question. Since concept accuracy was the study's major dependent variable, an effort was made to arrive at total agreement among investigators for this variable. In the few cases in which accuracy scores remained discrepant after two iterations, the investigators compared actual concept maps in the third iteration in order to arrive at complete agreement. Discrepancies in accuracy scores were determined to be the result of investigators overlooking concepts or miscalculating scores rather than incorrectly applying the scoring algorithm. The Pearson product moment correlation coefficient was used to determine the inter-rater reliability for concept and linkage scores. Level of agreement ranged from 0.90 to 0.95 for concept scores and from 0.94 to 0.97 for linkage scores. One hundred percent agreement was reached for accuracy scores.

Scoring of Oddi Continuing Learning Inventory

Investigators followed scoring instructions for the Oddi Continuing Learning Inventory, adjusting reversed scored items and calculating adjusted means for subjects' overall orientations to self-directed, continuing learning (total instrument), as well as for the other three constructs (factors) measured by different items of the instrument: (1) a general factor (15 items); (2) ability to be self-regulating (3 items); and, (3) avidity of reading (4 items) (Six, 1989). Cronbach's alpha was employed to test reliability and was found to be 0.87 for the total instrument, 0.91 for the general factor, 0.66, for the ability to be self-regulating factor, and 0.74 for the avidity of reading factor. The instrument and its three factors were judged to possess sufficient reliability to conduct further analyses.

Analysis

Since the two study groups and the two comparison groups were taught by the same instructors using the same content and instructional strategies, data from groups were combined for the purposes of analyses. Chi-square analysis was employed to test for independence between study and comparison groups on the basis of rank, service branch, gender, specialty (combat arms, combat support, and combat service support), last post (staff officer, leadership position, and other, such as student or instructor), and area of academic study (social sciences and humanities or physical and biological sciences). A two-tailed t-test was employed to test for difference among groups for years of military service.

A one-tailed t-test was employed to test for differences between groups for the dependent variables of concepts, linkages, accuracy, and the four measures of orientation toward self-directed, continuing learning (overall score and scores on the instrument's three factors). A one-tailed t-test was selected because previous theory and research suggest that the instructional approach and strategies employed in the study group should result in higher scores on dependent variables. A p-level of 0.05 was selected as the decision criterion to accept statistically significant differences.

Results

Sixty-four persons were members of the four staff groups that participated in the study. Of the 64 potential subjects, 60 completed concept maps, 61 provided demographic information, and 55 completed the OCLI. However, one person did not answer all OCLI items, leaving 54 useable learning inventories. Of the sixty-one subjects who provided demographic information, eight (13.1%) were captains, 48 (78.7%) were majors, and five (8.2%) were lieutenant colonels. All captains had been selected for promotion to the rank of major and were awaiting their actual promotion, which would occur within a few months. Forty-eight (78.7%) subjects were in the U. S. Army, four (6.6%) were in the Air Force, three (4.9%) in the Navy, and six (9.8%) were officers in other countries. Fifty-eight (95.1%) subjects were male, while three (4.9%) were female. Their years of military service ranged from 10 to 23 years, with the average being 13.70 years (S.D. = 2.47).

Thirty-four (55.7%) subjects' specialty was combat arms, 11 (18%) subjects' specialty was combat support, and 16 (26.2%) had a specialty of combat service support. Thirty-eight (62.3%) had been in staff positions in their previous assignments, nine (14.8%) had held leadership positions, and 14 (23%) held other types of positions, such as instructor or student. Fifty-four subjects provided data on the subject matter of their academic degrees, and of this number, 36 (66.7%) had their degrees in the social sciences or humanities, while 18 (33.3%) earned degrees in the physical or biological sciences.

No statistically significant differences were found in the composition of study and comparison groups on the basis of these demographic variables. This finding provides

confirmation that group assignment procedures used by the CGSOC result in heterogeneity within staff groups and like-composition among different staff groups.

One statistically significant difference was found between study and comparison groups. Accuracy scores of subjects in study groups were significantly higher ($p = 0.012$) than those of subjects in comparison groups. No statistically significant differences were found for concept scores, linkage scores, or the four measures of subjects' orientation to self-directed, continuing learning. The results of these analyses are portrayed in Table 1.

Table 1

Analysis of Dependent Variables by Study and Comparison Groups

Variable	Study Group Mean (n)	Comparison Group Mean (n)	t (df)	p
Concepts	56.59 (29)	49.81 (31)	1.00 (50.1)	.160
Linkages	41.34 (29)	35.51 (31)	1.02 (58)	.181
Accuracy	4.38 (29)	3.08 (31)	2.32 (58)	.012*
<u>Orientation to Self-Directed Continuing Learning</u>				
Overall Orientation	5.09 (27)	5.13 (27)	-.21 (42.7)	.83
General Factor	5.53 (27)	5.65 (27)	-.47 (38.4)	.64
Ability to be Self- Regulating	4.27 (27)	4.14 (27)	.35 (52)	.73
Avidity of Reading	4.28 (27)	4.14 (27)	.33 (52)	.74

Note. Degrees of freedom for three variables (concepts, overall orientation, and general factor) differ from usual degrees of freedom since adjustment in t-values were required due to unequal group variances.

*p<.05, one-tailed test

Discussion and Implications

The cued retrieval strategies of the modified PBL approach were shown to have a positive impact on the accuracy of subjects' recall as measured by concept maps. This finding underscores the efficacy of this modification for continuing military education. This is particularly important if accuracy in application of conceptual frameworks is key to competent leadership performance. Transfer of accurate recall to practice was beyond the scope of this study. However, this study's findings suggest that research on this topic is warranted.

Although no significant differences were found for the concepts and linkages variables, study group subjects nonetheless scored higher on these variables than comparison group subjects. Their concept maps were more elaborate, demonstrating more levels of concepts (hierarchy) and more complexity in linkages among concepts. This directionality in results suggests that a modified PBL approach may also have potential for positively affecting the elaboration (restructuring and tuning), not just accretion, of cognitive schemata. More research on this topic is also recommended.

The lack of significant differences between the study and comparison groups on measures of orientation to self-directed, continuing learning is attributable to two factors. First, observed instructional strategies and techniques in the study groups focused less than planned on subjects' developing learning issues and accessing resources in order to respond to cued retrieval questions and to dilemmas posed by the notational practical exercise. Second, while students in medical Problem-Based Learning curricula have been shown to exhibit significantly higher orientations to self-directed, continuing learning than students in conventional medical curricula, these differences appear later in the medical students' programs (Shulman, 1995). The effect that Problem-Based Learning has on the development of self-directed learning orientations appears, therefore, to require considerable time, a condition that was not present in this study. (The course in which the modified PBL approach was implemented lasted only two weeks.) The impact that any PBL strategy (and its interaction with time) has on the development of self-directed learning orientations requires further study.

References

- Albanese, M. A., & Mitchell, S. (1993). Problem-based learning: A review of the literature of its outcomes and implementation issues. Academic Medicine, 68(1), 52-81.
- Barrows, H. S. (1986). A taxonomy of problem-based learning methods. Medical Education, 20, 481-486.
- Blumeberg, P., & Michael, J. A. (1992). Development of self-directed learning behaviors in a partially teacher-directed problem-based learning curriculum. Teaching and Learning in Medicine, 4(1), 3-8.
- Bransford, J. D., Sherwood, R. S., & Sturdevant, T. (1987). Teaching thinking and problem-solving. In J. B. Baron & R. J. Sternberg (Eds.), Teaching thinking skills: Theory and practice (pp. 162-181). Freeman.
- Bridges, E. M., with Hallinger, P. (1992). Problem-based learning for administrators. Eugene, OR: ERIC Clearinghouse on Educational Management, University of Oregon.
- Caplow, J. A., Donaldson, J. R., Kardash, C. A., & Smith, K. (1994). Students conceptions of learning in a problem-based medical curriculum. Paper presented at the Annual Meeting of the Association for the Study of Higher Education, Tucson, AZ.
- Norman, G. R., & Schmidt, H. G. (1992). The psychological basis of problem-based learning. Academic Medicine, 67(9), 557-565.
- Novak, J. D., & Gowin, D. B. Learning how to learn. Cambridge, Great Britain: Cambridge University Press.
- Phye, G. D. (1992). Strategic transfer: A tool for academic problem-solving. Educational Psychology Review, 4(4), 393-421.
- Rafferty, D. C., & Fleschner, L. K. (1993). Concept mapping: A viable alternative to objective and essay exams. Reading Research and Instruction, 32(3), 25-34.
- Shulman, J. M. (1995). A comparison between traditional and problem-based learning medical students as self-directed continuing learners. Dissertation Abstracts International, 55(12), 3176.
- Sic, J. E. (1989). The generality of the underlying dimensions of the Oddi Continuing Learning Inventory. Adult Education Quarterly, 41(1), 43-51.

Tulving, E. (1983). Elements of episodic memory. New York: Oxford University Press.

Vernon, D., & Blake, R. (1993). Does problem-based learning work: A meta-analysis of evaluative research. Academic Medicine, 68(7), 550-563.

STRATEGIC, OPERATIONAL AND JOINT ENVIRONMENTS

Lesson 7. Strategic Estimate

Appendix 4 to the Advanced Sheet, Lesson 7. Practical Exercise Scenario and Student Requirement:
Strategic Estimate—Korean Peninsula/Northeast Asia

***** THIS PRACTICAL EXERCISE SCENARIO (NOTIONAL) IS FOR USACGSC USE ONLY *****

1. BACKGROUND.

a. Kim Jong Il, appears to have taken over the reins of power after the death of his father, Kim Il Sung, in July of 1994. However, Kim Jong Il has not appeared in public, except on rare important state occasions, and rumors continue to circulate on his fitness and competence as the leader of the Democratic People's Republic of Korea (DPRK). Economic problems continue to plague the regime, but the most significant problems are related to the US-DPRK Framework Agreement.

b. In October 1994, the US and the DPRK signed an agreement (actually three separate documents) to resolve the complicated dispute over North Korea's nuclear weapons program. In the winter of 1994-95 the US supplied oil to the North. Implementing the accords, the DPRK shut down its reactor at Yongbyon and allowed a limited inspection regime by the International Atomic Energy Agency (IAEA), a United Nations (UN) agency. The DPRK continues to search for a means to raise hard currency to feed its people and to maintain its huge defense establishment. Neither China nor Russia appear willing to provide anything but limited barter or cash and carry trade with the North. Weapons sales by the North, especially to Iran and Iraq, while earning needed funds, continue to be widely criticized.

c. In South Korea and the West, many see the election of the reform-minded Kim Young Sam, the first non-military President of the Republic of Korea since Syngman Rhee in the 1950s, as a key event in the democratization program and a signal of even stronger economic growth and maturity in the South. However, the increasingly open political environment has also led to demands for more autonomy and independence on international issues and greater leadership by the ROK in its own security affairs.

d. There is significant domestic debate in the ROK and in the U.S. Congress concerning the U.S. response to the DPRK's alleged nuclear arms development. Many question the appropriateness of the U.S. diplomatic and military efforts to date. Some critics call for complete disclosure and an immediate verified end to any nuclear weapons program in the North.

e. Increased direct talks and dialogue between the two Koreas had been steadily improving after signing a non-aggression pact in 1992, agreeing to nuclear inspections, accepting individual seats in the United Nations, and resolving the DPRK's threat to pull out of the Nuclear Non-proliferation Treaty in June 1993. A renewed effort following the Carter visit led to the October Framework Agreements. However, some analysts asserted that the North does not intend to allow joint inspections of all of its nuclear sites and could relocate its facilities to well-disguised, remote, underground facilities.

2. SITUATION.

a. The current crisis began early 1995 with the North Korean refusal to accept the two light water reactors from South Korea as originally agreed to in the October 1994 accords. After continued failed talks through the Summer of 1995, the DPRK delegation walked out and returned to North Korea with no indication of a time or place of

*****THIS PRACTICAL EXERCISE SCENARIO*****
***** IS FOR USACGSC USE ONLY*****

C510-7

renewed talks. While there has been no official abrogation of the October 1994 agreement, IAEA inspectors were asked to leave. The Clinton Administration has warned that it will impose economic sanctions unless the DPRK returns to the talks.

b. On 6 July 1995, the Korean People's Army (KPA) tested their No Dong missile with a launch off the east coast into the Sea of Japan. The Japanese government protested this unprecedented action and Japanese press portrayed this as a deliberate warning to Japan not to support UN and U.S. economic sanctions against the DPRK. The same day there were reports in the Middle East of additional North Korean weapons shipments to Iran and Iraq through a third party. The DPRK warned the U.S. about "interruptions of international shipping" during its press announcement warning against economic sanctions. Four days ago the ROK army reported small arms fire west of Panmunjom. The details of this activity are not available. However, since this incident, a heated exchange of escalating accusations has caused the political and the military situation to deteriorate and both countries' militaries are in a heightened state of alert. There are additional reports of small arms fire across the DMZ and both sides allege troop movement and exercise activity by the other in the vicinity of the DMZ. The ROK government has requested additional U.S. intelligence assets to monitor the situation, and that U.S. Army and Air Force personnel in Korea for an annual CPX (Ulchi Focus Lens) remain in-country.

d. Yesterday, Republic of Korea President Kim expressed grave concern over the North's purpose for precipitating an incident at this time and its ultimate objective. This may be the first major test for the DPRK's new leader, Kim Jong Il. There are rumors that senior DPRK military leaders, who at first were supportive of the new leader, are dissatisfied with the pace and direction of the changes in North Korea.

3. **REQUIREMENT.** The CJCS must attend a NSC meeting late tomorrow to discuss the reemerging "crisis" in Korea. He requested an immediate in-house strategic assessment of the situation on the Korean Peninsula and scheduled a video conference with USCINCPAC in preparation for this meeting. To prepare the CINC, USPACOM J-50 is chairing an ad hoc working group to develop courses of actions and recommendations for the CINC to use in his discussions with CJCS. As members of the USPACOM crisis planning cell (PACOM staff officers and selected representatives), analyze this situation, develop courses of action and make a recommendation. You'll have less than an hour with the CINC. As you know, he understands the region well and likes to understand the logic of your analysis, so you'll have to be concise. He'll want to understand who are the key players and what are their interests and objectives. He'll also be concerned about the synchronization of all of the instruments of national power.

4. **ADMINISTRATIVE NOTES:**

a. Your DJCO instructor will assign the following staff positions and provide the appropriate resource packets:

J-50	Deputy Director, Strategic Plans and Policy Directorate	_____
J-511	Country Desk Officer—Korea	_____
J-511	Country Desk Officer—Japan	_____
J-511	Country Desk Officer—Russia	_____
J-511	Country Desk Officer—China	_____
J-41	Chief, International Logistics Division	_____
FPA1	Assistant Foreign Policy Advisor	_____
Liaison	COMUSKOREA	_____
Liaison	COMUSJAPAN	_____
Representative	CDR, MARFORPAC	_____
Representative	CINCPACFLT	_____

L7-A4-2

Implementing Two Elements (Activation of Prior Knowledge & Identification of Learning Issues) of Problem-Based Learning in C510 Lesson 7: Strategic Estimate - Korean Peninsula/Northeast Asia

Format for PE Scenario of Lesson 7:

- In 2 Groups, Students read "Background" Section of Scenario and respond to Questions
- Briefing on Background: Regroup in Staff group and discuss responses to questions
- In 2 Groups, Students read "Situation" Section of Scenario and respond to Questions
- Briefing on Situation: Regroup in Staff group and discuss responses to questions
In Staff Group, Discuss COA and Strategic Estimate
(Learning Issues will be identified in conjunction with this discussion)

* 2 Students (one for each group) will be given the Questions the day prior to the exercise.
Students will facilitate group's discussion of the questions

I. "Background" Questions [The Following questions are for groups of 7-9 students)
[Questions to be asked after students have read the Background Section of the PE Scenario]

1. What instruments of power have been employed to date? (Probe for all)
[DIME/Lesson 1]
2. What are categories of U.S. national interest that might merit the use of military power in Korea? *[National Interest/Lesson 0 & 1]*
3. What are the sources of power to this point? *[Sources of Power/Lesson 1]*
4. What are the joint and combined structures in Northeast Asia? How do they function and what are combined/multinational considerations associated with them? *[Lesson 3 & 6]*
5. What are capabilities and limitations of U.S. services in the region? *[Lesson 4]*
6. Which view -- Kaplan, Tofler, Huntington -- best explains today's environment in Korea?
[Lesson 2]
7. To summarize to this point, What's Known? What's Unclear? What's Presumed?
[Identification of Learning Issues]

II. "Situation" Questions (The following questions are for groups of 7-9 students)

[Questions to be asked after students have read the Situation Section of the PE Scenario]

1a. What recognition is given to Northeast Asia in the NMS and the NSS? What are the three goals of NSS for the region?

1b. What recognition is given to Korea in the NMS and the NSS? What are the three goals of NSS for Korea? As described in this situation, which strategic goal(s) is/are most at risk?
[Lesson 2 and Advanced Readings for Lesson 7]

2. Who are the actors in this situation?

3. Given this situation:

- a. What instruments of power should be employed?
- b. What categories of U.S. national interest would merit the use of military power?
- c. What are the sources of power?

4. What are the similarities between this situation and the other PEs we've had on Korea?

5. What are the differences between this situation and the other PEs we've had on Korea?

Demographic Information

Note: All information gathered is for researchers' use only to provide context for the analysis of your conceptual map. Your response is completely voluntary and will be held in the most strict confidence.

- 1) Rank Captain, Major, LTC (or equivalent)
- 2) USAF USN Army Marine International (Country _____)
- 3) Male Female
- 4) Specialty(ies) (E.g., Infantry) _____.
- 5) Years of service _____.
- 6) Last duty position (not location) _____.
- 7) Favorite hobby _____.
- 8) Academic Area(s) in which degree(s) was(were) awarded:
_____.

Making a Concept Map

A concept map is a graphical representation of concepts and their interrelationships. In a concept map, related concepts are represented as "nodes" and the specific relationship between two concepts is indicated by "linking words". Your task is to draw a map that centers around the concept of the "strategic estimate", but first I want to show you an example of a concept map I developed for the "wearing of military uniforms."

Here's the way I made a concept map for the wearing of military uniforms. To make the map, I started by thinking, for a few minutes, about the focal concept, i.e., the wearing of military uniforms. I wrote down the key concepts, terms, and examples that I thought were important to describe the wearing of military uniforms. I placed them in a single column as shown in the example.

When the list was complete, I sorted the concepts, terms and examples into clusters according to the extent to which they were related by making larger categories in Column 2. I then linked the concepts from Column 1 to the major categories in Column 2 with lines. Your groupings and examples regarding the strategic estimate will reflect your personal judgments about the closeness of associations among the terms. Each person's concept map will be different, so don't worry about whether your map is the same as someone else's, or if they have more terms or groups than you do.

Next, I constructed a map and arranged and linked the focal concept, the wearing of military uniforms, and the clusters of concepts with lines. I positioned the focal concept on the paper with plenty of room to arrange my clusters around the concept. I used arrows to indicate the direction of the relationship that existed between the concepts; relationships may be in one direction or both directions. You should be sure to include relationships, or cross-links, that exist between different clusters of concepts as well as relationships within the clusters. If you must draw one connecting link so that it intersects another connecting link, but you do not wish to indicate the corresponding concepts are related, draw a small circle around the point of intersection.

Finally, I labeled the connecting lines on my map to show valid and meaningful relationships between the concepts. You should work with one pair of concepts at a time. Some examples of linking words are: is a, is part, has property, consists of, involves, with, by, and requires.

Now you will do the same mapping process for the strategic estimate. Remember, each person's concept map will be different. Your map is one indication of how **you** think about the strategic estimate, and there is no right nor wrong way to arrange the terms. **This is not a test on the strategic estimate!**

Column 1

Service cap
Tradition
Symbol
Ironing
Official Photos
Raincoat
Low Quarters
Boots
Shirts
Medals
Class A
Class B
BDUs
Unit Patch
Combat Patch
Rank
Branch Insignia
Haircut
Polish
Fitting
Occasions
Costs
Mess Blues
Whites
Dress Blues
Ties
Socks
Boots
Belts
Headgear
Caps
Garison Cap
Gortex Parka
Camouflage
Precedence

Column 2

Accessories

Add-ons

Appearance

Occasions

Conceptual map

Cost (vertical axis on the left)

Choice Decides (diagonal axis on the left)

Appearance (central node)

- Official Photos
- Tradition
- Symbol
- Haircut
- Fitting
- Polish
- Ironing
- Add-ons

Wearing Military Uniforms (central node)

- Raincoat
- Gortex Parka
- Headgear
- Service Cap
- Garrison Cap
- Caps

Accessories (central node)

- Shirts
- Ties
- Footwear
- Socks
- Belts
- Low quarters
- Boots

Add-ons (central node)

- Unit patch
- Combat patch
- Rank
- Branch Insignia
- Badges
- Medals

Occasions (central node)

- Whites
- Dress Blues
- Class A
- Class B
- BDUs
- Camouflage

Precedence of Arrangement (bottom right)

C-4